University Algebra, by Richard E. Johnson. Prentice-Hall, 1966. xii + 271 pages. $7.95.

This book has thirteen chapters, covering such standard concepts as groups, fields, rings, vector spaces, and determinants, with additional material on algebraic extensions, factorization in integral domains, lattices, etc. The reviewer has read carefully (and taught from) only the first five and one-half chapters and cannot comment on the remainder of the book.

The material on set theory and number theory is very skimpy (there are no exercises on the former and only a few on the latter). The author apparently assumes that the students will have been introduced to these topics elsewhere and will have acquired some competence in them (many exercises in later chapters require a real familiarity with elementary number theory). He also states certain basic facts (such as the completeness property of the real numbers) without making it clear whether the student should regard them as axioms or theorems.

The author is sometimes too intent on generality, and sometimes not intent enough. His definitions of the greatest common divisor and least common multiple of two integers beg the question of existence and do not yield unique integers, but they are the right definitions in more general integral domains. He proves Euclid's theorem that $p|ab$ implies $p|a$ or $p|b$, then postpones for six chapters a proof of the fundamental theorem of arithmetic, so that the latter becomes a special case of a theorem on unique factorization domains. On the other hand, he devotes separate chapters to Abelian groups and commutative rings before discussing general groups and rings, thus causing a certain amount of confusion, wasted effort and unnecessary restrictions in the statements of theorems (for example, the general associative law and some of the laws of exponents hold in any group, and it is slightly confusing to embed their proofs in a chapter on Abelian groups).

Although there are probably enough hard problems, there are not nearly enough of a routine or computational nature to enable the student to get well-acquainted with the concepts. The book has an egregious number of misprints and small errors, and the booklet of selected answers to problems (published separately) is untrustworthy. For a long list of errata and various additional comments (covering the first third of the book), interested readers may write the reviewer.

Karl K. Norton, University of Colorado (Boulder)

Abstract Algebra, by C.-H. Sah. Academic Press, New York and London, 1967. xiii + 352 pages. $9.75.

This is a text for an advanced course for upper undergraduate or